SOME ACCOUNT OF THE SYNONYMY AND AFFINITIES OF *DONOVANIA MINIMA* (Mont.).

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The observations recorded in this note were made at the suggestion of Mr. E. R. Sykes, who sent me two live specimens of *Donovania minima*, with the request that I would endeavour to determine its correct systematic position, considerable uncertainty existing as to whether it should be regarded as belonging to the Pleurotomidæ, or to the Muricidæ.

On looking up the various published descriptions of this shell I found that, in addition to the uncertainty regarding its affinities, there was an almost worse confusion concerning its name. I have, therefore, been at some pains to work out the synonymy of this species, and though in the end I have adopted the name *Donovania*, given by Bucquoy, Dautzenberg, and Dollfus, yet, since I do not quite agree with all the synonyms they have accepted for it, I have ventured to append a short account of my re-investigation of the subject.

The earliest undoubted record is generally admitted to be that of Montagu, in 1803,[1] when, under the name of *Buccinum minimum*, he described a small shell answering perfectly to an almost mature specimen of *Donovania*. His figure is bad and unrecognisable, but the description, as regards form, sculpture, colour, size, and locality, fits extremely well. Hence Montagu's specific name is still retained. There seems, however, to have been a doubt in the minds of some writers whether Montagu, or Donovan first named this shell. The latter author figured and described[2] very briefly, under the name of *Buccinum brunneum*, a shell which appears to correspond to Montagu's *Buccinum minimum*. Considerable confusion exists as to the exact date of publication of the various volumes of Donovan's British Shells, vol. v being variously given as 1802 and 1803. Mr. C. Davies Sherborn,[3] who has investigated this matter, informs me that there is little doubt that the second half of vol. v, which contains

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[1] Montagu, Test. Brit., pt. i (1803), p. 247, pl. viii, fig. 2.

[2] Nat. Hist. Brit. Shells, vol. v, pl. cxix, fig. 2.

[3] Mr. C. D. Sherborn's investigations show that the work was published in sixty monthly parts, of which the first was issued in 1799 (month not known). The five volumes appeared as follows: vol. i, 1799–1800; vol. ii, 1800–1; vol. iii, 1801–2; vol. iv, 1802–3; vol. v, 1803–4. Thus the later part of vol. v, in which he describes *Buccinum brunneum*, did not appear until 1804.

the description of *Buccinum brunneum*, was not published till 1804, so that Montagu's *Buccinum minimum*, 1803, evidently has priority.

The *B. minimum* of Montagu was accepted by all the early conchological writers, Maton & Rackett, De Blainville, Dillwyn, and possibly Wood, whose figure, however, suggests a hairy shell. Fleming, who called it *Fusus minimus*, was the first to throw doubt on its determination as a *Buccinum*.

In 1826 Risso [1] described three new genera of Gastropoda—*Lachesis*, *Anna*, and *Nesæa* (two species)—which call for special comment. The descriptions of these are not very precise, but the figures are very clear, and if correct, appear to me to show that neither *Lachesis*, nor *Nesæa* has anything to do with Montagu's *Buccinum minimum*; this conclusion is supported by the definitions of the genera, so far as they go.

The type of the genus *Anna*, which Risso placed with the Pleurotomidæ, more nearly resembles our shell, but differs from it conspicuously in size, being 10 mm. long, whereas *Buccinum minimum*, Mont., rarely exceeds 5 mm. *Anna*, moreover, was a fossil form. All traces of this type appear to have been lost, and I can find no mention of later date of an undoubted *Anna*. Thus it seems inadvisable, considering the uncertainty with which this genus is enshrouded, and its slight resemblance only to *Buccinum minimum*, to refer the latter to it.

After this date we find Montagu's shell masquerading under a variety of names; it becomes the *Nassa minima* of Brown, and, according to some, the *Fusus subnigris* of the same author, but this I think doubtful, since that shell is considerably larger than Montagu's.

It seems to me extremely probable that a slightly larger Mediterranean species [2] of the same genus, having more whorls than Montagu's shell, has been confused with the latter, and as such I should regard *Buccinum minimum*, Philippi, *B. rubrum*, Potiez & Michaud, and *Fusus turritellatus*, Deshayes.

Further confusion regarding Montagu's shell was introduced by Grey, [3] when he revived Risso's genus *Anna*, and regarded *A. Massena*, Risso, as synonymous with *Buccinum minimum*, Mont., *Fusus turritellatus*, Desh., and *Buccinum Scacchianum*, Philippi, thus confusing at least two, if not three or four, perfectly distinct shells. *B. Scacchianum*, Philippi (= *Purpura picta* of Turton and of Scacchi, and *Nassa picta* of Brown), is probably a *Columbella*, and in no way resembles *Buccinum minimum*, *Fusus turritellatus*, or *Anna Massena*. Grey also regarded Risso's two genera *Lachesis* and *Nesæa* as identical and as synonyms of *Pisania*.[4]

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[1] Nat. Hist., tom. iv, pp. 211, 214, and 233, pl. v, figs. 65, 67, 68, and 69.
[2] Monterosato mentions five Mediterranean species of the genus *Lachesis* (? = *Donovania*).
[3] Proc. Zool. Soc., 1847, p. 134.
[4] T.c., p. 133.

The earliest record which I can find of the application of Risso's generic term *Lachesis* to Montagu's *Buccinum minimum* is in S. P. Woodward's Manual in 1851, and from that date Montagu's shell appears to have been known under this name to most conchologists (e.g., Forbes & Hanley, Adams, Gwyn Jeffreys, Monterosato, and Fischer). In 1882 Bucquoy, Dautzenberg, and Dollfus proposed the name *Donovania* for this shell on the grounds that *Lachesis* and *Nesæa* were both preoccupied; these authors give a very excellent account of this shell, and a full synonymy, but are, I think, wrong in their conclusion that the genera *Lachesis* and *Nesæa* of Risso were founded upon specimens of *Buccinum minimum*, Mont. I do not know whether S. P. Woodward was the first to perpetrate this error, but am sure that a careful comparison of Risso's figures and description of *Lachesis* and *Nesæa* with a good example of Montagu's shell will show that they are quite distinct. We are indebted, therefore, to MM. Bucquoy, Dautzenberg, and Dollfus for a very appropriate name for *Buccinum minimum*, Mont., and may in future safely speak of the shell as *Donovania minima* (Mont.).

With respect to its systematic position, *Donovania minima* was of course originally placed in the Buccinidæ, and with slight wanderings held this position until 1847, when Grey placed it, under the generic name *Anna*, in his section Conina of the family Muricidæ. S. P. Woodward in 1851 placed it doubtfully as a section of *Pleurotoma*. Forbes & Hanley referred it in 1855 to the Muricidæ, but Adams in 1858 restored it to the Pleurotomidæ; in 1867 Jeffreys, who first describes the animal, placed it in the Muricidæ; Bucquoy, Dautzenberg, and Dollfus, and, following these authors, Tryon, placed it with the Pleurotomidæ, whilst, lastly, Fischer returned it once more to the Muricidæ.

Some differences exist between the various published descriptions of the shell of *Donovania*, owing to the fact that many of these were based upon immature specimens. It is apparently only late in life, though not necessarily only in the largest specimens, that the outer lip becomes thickened, and 5–6 inconspicuous ridges or denticulations, appear on its inner side. There are six rounded whorls, the apical one (the protoconch) alone differing in sculpture; this last is generally slightly inclined to the major axis of the shell, globose, and at first finely granular, but gradually develops fine longitudinal ribs, which lower down become obscured by the conspicuous transverse spiral striæ.

The operculum (Fig. I) is flattened and broad, the nucleus being apical. Fischer compares it with that of *Ocinebra*, but it appears to me, from the position of the nucleus, to approximate more to that of *Pisania*.

The animal (Fig. II) is of a pale yellowish, translucent, white, with opaque white dots scattered over the surface of the foot, body, and siphon. The siphon is large; the tentacles moderately developed, thickened proximally for rather more than one-third of their total length, the eyes being situated at the posterior side at the distal end of this thickened portion, the extremities of the tentacles taper

slightly; a well-marked penis is present; the foot is long and narrow, slightly expanded anteriorly, where it presents a convex border, divided into two by a transverse groove, the latter being continued up the side of the foot almost to the operculum, this groove probably separates the propodium from the mesopodium, posteriorly the foot tapers very slightly, and is finally rounded off; the operculum projects on either side of the foot.

The radula is long and narrow, and typically rhachiglossate; it consists of about fifty transverse rows, each of which is composed of three teeth (Fig. III). The median tooth presents a roughly quadrangular base, the anterior border being concave, and a small backwardly directed conical cusp; the lateral teeth are large and

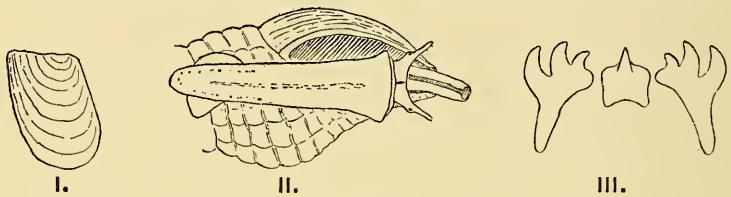

Fig. I. Operculum of *Donovania minima*.
,, II. Ventral aspect of the animal.
,, III. Transverse row of teeth from the radula.
(All considerably magnified.)

tricuspid, the cusps incurved and increasing in size from within outwards, the base is concave anteriorly, and produced laterally into a handle-like process.

The character of the radula shows at once that *Donovania* has no connection with the Pleurotomidæ, but that it is typically rhachiglossate. It, however, differs considerably from the Muricidæ in the form of its teeth, approaching more nearly to the Buccinidæ, and amongst them perhaps most closely to *Pisania*. In its central tooth we find a suggestion of *Sipho*, while its lateral teeth are much more buccinoid, but peculiar in the lateral prolongation of the base.

Fischer places the genus *Pisania* in the Buccinidæ, and to that family I think we should also refer *Donovania*, ranking it next to *Pisania*, which it approximates somewhat, as already mentioned, both in its radula and operculum.